What is claimed is:

1 An optical network comprising:

a central source providing light in a plurality of spaced wavelength bands and including variable-gain optical amplifiers enabling the relative intensity of light in respective wavelength bands to be varied;

plural distributed terminals operable to modulate and return received light in any of the said wavelength bands; and

a wavelength-routed network receiving light in all the said wavelength bands from the central source and routing each wavelength band to a respective one of the terminals.

2 An optical network as claimed in claim 1 in which the variable-gain optical amplifiers are an array of semiconductor optical amplifiers and are followed by a wavelength-division multiplexer for receiving their outputs and passing them together to the wavelength-routed network.

3 An optical network as claimed in claim 2 in which the semiconductor optical amplifiers are also preceded by a wavelength-division demultiplexer receiving light from a single multi-band source.

4 An optical network as claimed in claim 1 in which the central source is a spectral-slicing source in which light in a continuous range of wavelengths is generated and spaced wavelength bands selected from it.

5 An optical network as claimed in claim 4 in which the light generator is selected from the group consisting of

- rare-earth doped fibre amplifiers,
- semiconductor optical amplifiers,
- super-continuum sources,
- mode-locked lasers
- superluminescent diodes,
- other light-emitting diodes of sufficient optical power and spectral bandwidth, and
- wavelength combs.

6 An optical network as claimed in claim 5 comprising wavelength-division multiplexers for slicing to obtain the required spaced wavebands, said multiplexers being selected from the group consisting of arrayed-waveguide gratings, thin-film filters,

directional couplers, and filters of the blazed-grating type.

7 An optical network as claimed in claim 1 in which at least some terminals each comprise a reflection modulator.

8 An optical network as claimed in claim 1 in which all the terminals are substantially identical.

9 An optical network as claimed claim 1 in which the said wavelength-routed network is entirely passive.

10 A method of controlling an optical network comprising forming the network with:

a central source providing light in a plurality of spaced wavelength bands and including variable-gain optical amplifiers enabling the relative intensity of light in respective wavelength bands to be varied;

plural distributed terminals operable to modulate and return received light in any of the said wavelength bands; and

a wavelength-routed network receiving light in all the said wavelength bands from the central source and routing each wavelength band to a respective one of the terminals

and adjusting the said variable optical amplifiers individually to determine the level of light reaching the respective terminals.

11 An optical network comprising:

a central source providing light in a plurality of spaced wavelength bands, the relative intensity of light in respective said wavelength bands being individually variable;

plural distributed terminals operable to modulate and return received light in any of the said wavelength bands; and

a wavelength-routed network receiving light in all the said wavelength bands from the central source and routing each wavelength band to a respective one of the terminals.

12 A method of controlling an optical network comprising forming the network with:

a central source providing light in a plurality of spaced wavelength bands, the relative intensity of light in respective said wavelength bands being individually variable;

plural distributed terminals operable to modulate and return received light in any of the said wavelength bands; and

a wavelength-routed network receiving light in all the said wavelength bands from

the central source and routing each wavelength band to a respective one of the terminals

and adjusting the relative intensity of light in respective said wavelength bands individually to determine the level of light reaching the respective terminals.